

CAPTAIN OF THE PORT, SAN FRANCISCO PUBLIC ADVISORY 01-97

Subj: TRANSPORT AND HANDLING OF COMMERCIAL EXPLOSIVES

Ref:

- (a) COTP Advisory 3-95, Vessels Carrying Certain Dangerous Cargoes
- (b) DOD 6055.9-STD, DOD Ammunition & Explosives Safety Standards
- (c) Oakland Tariff No. 2-A Hazardous Materials Rules and Regulations
- (d) Marine Safety Manual Vol VI, I.L. COMDTINST M16000.11
- (e) Title 33 Code of Federal Regulation Parts 110.224, 33 CFR 126, and 49 CFR 176 Subpart G

1. **PURPOSE:** This notice further clarifies the COTP requirements and reviews criteria for the handling and transport of explosives. Specifically, this applies to the transport of explosives through the port, the activation of explosive anchorages for vessels carrying explosives, and also the handling of explosives at waterfront facilities.

2. **DEFINITIONS:**

- a. COTP - Captain of the Port San Francisco Bay as defined in 33 CFR 1.01-30.
- b. N.E.W. - Net Explosive Weight (weight of the actual explosive material minus any casing).

3. **DISCUSSION:** The handling and transport of hazard class 1 explosives is a common occurrence within the San Francisco Bay Area. Military explosives are shipped to and from the Concord Naval Weapons Station and commercial explosives are primarily shipped in and out of the Port of Oakland. The San Francisco Bay area is heavily populated, and proper oversight of explosives transported in the area is critical to maintaining port and public safety. The following information is intended to provide clarification, for persons transporting explosives, about Coast Guard COTP requirements and review processes. Questions relating to this notice may be addressed to me in writing or directly through the Port Operations Department at (510) 437-3073. Any request for waivers to exceed established limits of allowable explosives must be made in writing. The COTP will accept facsimile requests at (510) 437-3072.

a. Vessels Transporting Explosives

(1) Vessels Transiting with Explosives

- a. Reference (a) discusses several requirements for vessels carrying certain dangerous cargoes such as explosives. Vessels carrying explosives in the port may transit provided visibility does not fall below 1000 yards. If the situation warrants, the COTP may require vessels carrying dangerous cargoes to be escorted by a Coast Guard vessel.
- b. The amount of commercial explosives a commercial vessel is allowed to carry in the port will largely be determined by where they will be anchoring or handling the explosives. **While a vessel is at berth, the amount of explosives in consideration will be the total amount of explosives on the terminal (explosives originating from or going to the vessel) and the amount of explosives on board the vessel.** This total shall not exceed quantity-distances limits established by local authorities. However, parties may request waivers from these limits (see "Handling of Explosives at Waterfront Facilities" below).
- c. Military explosives shipped by or for the Armed Forces of the United States that are on a commercial waterfront facility and on the vessel shall not exceed the quantity-distances limits established by the COTP (33 CFR 126.19 (c)). Quantity-distance limits for explosives at Department of Defense facilities are established by the DOD Explosive Safety Board (ref. (b)).

(2) Vessels Anchored with Explosives

- a. Per 33 CFR 110.224(c), vessels carrying explosives and requiring anchorage or vessels being loaded with explosives at anchor must do so in a designated explosive anchorage. The explosive anchorages in the San Francisco Bay area include Anchorage 12, 13, 30, and 14. Anchorage 14 is the primary explosive anchorage and it is located in general Anchorage 9. The maximum amount of explosives allowed in the anchorage is 3,000 tons. Since anchorage space is assigned on a first come basis, requests to activate A-14 must be made sufficiently in advance. If A-9 is full, a request for A-14 activation may be denied. Advance notice will aid Coast Guard Vessel Traffic Service in coordinating anchorage space to accommodate all ships. Parties requesting the activation of an explosive anchorage must do so in writing. These request must include the shipment N.E.W., the date and times of requested anchorage activation, the vessel name and vessel official number.
- b. Requests can be made to exceed established N.E.W. limits, but they must be made in writing and will be considered on a case by case basis. Evaluations of these requests will be largely based on the potential blast arc created by the amount of explosives

and its impact on the public or other vessels in the vicinity. This is further discussed in the "Risk Assessment" section below.

b. Handling of Explosives at Waterfront Facilities

(1) Under 33 CFR 126, designated waterfront facilities of particular hazard are required to have a written COTP permit to handle hazard class division 1.1, 1.2, and 1.5 explosives. A general COTP permit (verbal permission) is granted to designated waterfront facilities handling hazard division class 1.3 and 1.4 explosives. Per 33 CFR 126.19, as part of the permitting process, the COTP ensures that the amount of explosives handled does not exceed those quantities established by local, municipal, or State authorities. These entities directly represent the interests of the local public. Currently, only the Port of Oakland has established tariff policies for the handling of explosives (see reference (c) and enclosure (1) for a summary). This tariff also specifies the length of time explosives are allowed to remain on a terminal. For ports that do not have established local policies for amounts of explosives allowed at waterfront facilities, the COTP can establish safe allowable limits.

(2) Parties may request a waiver to exceed N.E.W. limits imposed at a facility. Requests to exceed established limits must be made in writing with the local port authority. Often times, as with the Port of Oakland, these requests are reviewed by both the port authority and the COTP. The COTP will evaluate these requests based on the potential blast arc created by the total amount of explosives on both the vessel and on the terminal. This evaluation is further discussed in the "Risk Assessment" section.

c. Risk Assessment

Reference (b) provides detailed equations determining the hazards of shipments of explosives. The resulting effect of detonated explosives is often referred to as an explosive arc. The following provides the method used to establish these arcs. Frequently a shipment of explosives is a mixture of hazard class divisions 1.1, 1.2, 1.3, and 1.4. Per reference (d), for a mixed shipment of explosives, the total N.E.W. (net explosive weight) should be treated as a sum of hazard class division 1.1 explosives, regardless of the hazard class divisions.

Explosive Arc (radius) in feet = $(\text{N.E.W. LBS})^{1/3} \times K$
(N.E.W.) $^{1/3}$ = cubed root of N.E.W.

K = 50 to determine damage to populated areas

K = 8 to determine the damage to populated areas of loads exclusively made up of hazard class division 1.5, (due to its insensitive characteristics)

K = 18 to determine damage to ships at anchorage

Risk Assessment

Example:

The following example illustrates a method to evaluate the safety in allowing an explosive carrying vessel to anchor in Anchorage 14; however, this is not the sole evaluation criteria. A vessel requests the COTP's permission to anchor in Anchorage 14 with 3,1000 tons N.E.W. of mixed hazard class division 1 explosives. Also, the request includes a waiver to exceed the 3000 ton explosives limit for the anchorage. The following is a calculation of the explosive arcs. Note that tons were converted to pounds.

Arc for populated areas:

$$(6.2 \text{ million lbs})^{1/3} \times 50 = 183.7 \times 50 = \mathbf{9,185 \text{ ft or } 3,062 \text{ yds}}$$

Arc for ships:

$$(6.2 \text{ million lbs})^{1/3} \times 18 = \mathbf{3,307 \text{ feet or } 1,102 \text{ yards}}$$

In this case, if the explosive carrying vessel was to anchor in A-14, the blast arc of 3,062 yards would not touch land so as to pose a threat to a populated area. The blast arc of 1102 yards does not appear to pose a threat to other vessels. Based on this alone, the approval and waiver to anchor could be allowed. However, other issues that might affect the approval process include the vessel's boarding history, condition, fire fighting abilities, etc.

4. **SUMMARY:** Compliance with this COTP Public Advisory will allow for the safe management of explosives transported in the port. The proper coordination of activities will also prevent delays in the shipment of these commodities.

Encl: (1) Port of Oakland Hazardous Materials Tariff Requirement Summary

**LOCAL HAZARDOUS MATERIALS REQUIREMENTS FOR PORT OF OAKLAND/CITY OF OAKLAND FOR
CONTAINERIZED HAZARDOUS MATERIALS**
(REVISION 12/96 - PAGE 1/2)

HAZARD CLASS - 49 CFR	IMCO CLASS	PERMIT	RESTRICTIONS: TIME ON TERMINAL, WEIGHT PER CONTAINER; OTHER.
EXPLOSIVES Class 1.1	Class 1 Div 1.1	City-Port COTP-1	Only 2 hours & 13.5 tons Net Explosive Wt on terminal at one time.
EXPLOSIVES Class 1.2	Class 1 Div 1.2	City-Port COTP-1	Same for Class 1.1, but explosive allowed up to 24hrs on terminal.
EXPLOSIVES Class 1.3	Class 1 Div 1.3	City-Port COTP-2	Same for Class 1.1, but explosives allowed to 24 hrs on terminal.
EXPLOSIVES Class 1.4	Class 1 Div 1.4	City-Port COTP-2	Only 24 hours & 100 tons NEW on terminal at one time
EXPLOSIVES Blasting Agent	Class 1 Div 1.5	City-Port COTP-1	Same as Class 1.4
OXIDIZER	Class 5 Div 5.1	City-Port COTP-3	Only 24 hours on terminal & 20 tons NEW on terminal.
ORGANIC PEROXIDE (Oxidizing Substance)	Class 5 Div 5.2	NONE	NONE
RADIOACTIVE MATERIAL	Class 7	City-Port COTP-2	No Spent Fuel allowed to transit the Port of Oakland.
POISON 'A'	Class 2 Div 2.3	NONE	NONE
FLAMMABLE SOLID	Class 4 Div 4.1 Div 4.2 Div 4.3	*COTP-3	NONE
FLAMMABLE GAS	Class 2 Div 2.1	*COTP-3	NONE
FLAMMABLE LIQUID	Class 3 Div 3.1 Div 3.2 Div 3.3	*COTP-3	NONE
COMBUSTIBLE LIQUID	Class 3 Div 3.3	NONE	NONE
POISON 'B'	Class 6 Div 6.1	NONE	NONE
ETIOLOGIC AGENTS	Class 6 Div 6.2	NONE	NONE
NONFLAMMABLE GAS	Class 2 Div 2.2	NONE	NONE
CORROSIVE MATERIAL	Class 8	NONE	NONE
OTHER REGULATED MATERIAL	Class 9	NONE	NONE

*COTP-# = USCG Captain of the Port permit requirement (see next page)

REFER TO THE PORT OF OAKLAND NO. 2-A TARIFF & 49 CFR FOR COMPLETE REQUIREMENTS.

LOCAL HAZARDOUS MATERIALS REQUIREMENTS FOR PORT OF OAKLAND/CITY OF OAKLAND FOR
CONTAINERIZED HAZARDOUS MATERIALS
(REVISION 12/96 - PAGE 2/2)

IN RECOGNITION OF THE VARYING DEGREES OF HAZARD INHERENT IN CERTAIN DANGEROUS CARGOES, THE FOLLOWING ARE THE PERMIT REQUIREMENTS AS SET FOR THE BY CODE OF FEDERAL REGULATIONS AND THE CAPTAIN OF THE PORT (COTP) SAN FRANCISCO BAY.

COTP-1: A COTP PERMIT NUMBER AND WRITTEN PERMIT (FORM 4260) IS ISSUED FOR THE FOLLOWING:

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|-------------------------------------|--|
| * DIVISION 1.1 & 1.2 EXPLOSIVES | 49 CFR 176.100
33 CFR 126.17
33 CFR 126.09 |
| * BLASTING AGENTS DIVISION 1.5 | 49 CFR 176.415 |
| * AMMONIUM NITRATES | 49 CFR 176.415 |
| * CERTAIN AMMONIUM NITRATE MIXTURES | |

NOTE: THESE CARGOES WILL BE INSPECTED PRIOR TO LOADING BY A USCG INSPECTION TEAM OR THE NATIONAL CARGO BUREAU.

COTP-2: A NOTIFICATION TO THE COTP FOR A PERMIT NUMBER IS REQUIRED FOR THE FOLLOWING (REF. 33 CFR 127.27(B)):

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|---|--|
| * EXPLOSIVES DIV 1.3 | > 1 TON |
| * EXPLOSIVES DIV 1.4 | > 10 TON |
| * FLAMMABLE LIQUIDS | > 10 TON |
| * FLAMMABLE SOLIDS OR OXIDIZERS | > 100 TON |
| * FLAMMABLE GASES | > 10 TONS |
| * RADIOACTIVE MATERIAL | HIGHWAY ROUTE CONTROLLED
QUANTITIES (49 CFR 173.403(2)) |
| * BULK SHIPMENTS OF CARGO OF PARTICULAR HAZARD AS DEFINED IN 33
CFR 126.10(C) AND (D). EXAMPLES: ANHYDROUS AMMONIA, RADIOACTIVE
MATERIAL, OLEUM, ETC. | |

NOTE: THESE CARGO TRANSFERS WILL BE INSPECTED PERIODICALLY BY USCG INSPECTION TEAMS.

TRANSPORT OF CLASS 1 (EXPLOSIVE) MATERIAL IN FREIGHT CONTAINERS (REF. 49 CFR 176.170)

- * MAXIMUM WEIGHT OF CLASS 1 MATERIAL (EXCEPT DIVISION 1.4) IN A CONTAINER >20 FEET IS 11,023 LBS (5,000 KG).
- * TO APPLY FOR AN EXEMPTION TO 49 CFR SUBPART 'C', REFER TO 49 CFR 107.103 AND LOCAL COTP OFFICE (510) 437-3073.